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Four Remarkable Phalangids from Korea

With 7 Text-figures

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ABSTRACT The present paper deals with 4 remarkable phalangids from Korea, including 3 forms which are new to science, *Ischyropsalis coreana* n. sp., *Peltonychia coreana* n. sp. and *P. c. longipes* n. s. sp. These phalangids are of interest from the viewpoint of biogeography.

Lately numerous specimens of Korean phalangids have been presented by Mr. Nam-Gung, teacher of Mukeug Junior High School, Eumseong, Chungbug, Korea to the author for identification. The material included four remarkable forms, three of which are new to science. The present paper is concerned with the descriptions and some information on these specimens. The material not treated in this report will be published in a separate article. The specimens examined were all collected by Mr. J. Nam-Gung. The types are deposited in the Zoological Laboratory, Faculty of Science, Hiroshima University.

Suborder Dyspnoi (Hansen et Soerensen)

Family Ischyropsalidae Simon

Ischyropsalis coreana n. sp.

(Figs. 1-2)

Male.—

Dorsum (Fig. 1). Body very small, more or less rounded and bluntly pointed posteriorly. 1—5 abdominal tergites do not form a hard scutum, but loosely unite with one another. Dorsal integument of cephalothorax smooth, only a few microscopic granules situated between the eye tubercle and lateral margin. The first thoracic tergite has a few granules and the second a transverse row of about eight granules. All abdominal tergites are furnished with similar granules, the granules increasing in size posteriorly. Eye tubercle: from dorsal 0.32 mm wide, 0.25 mm long, very low, furnished with a few minute granules above the eye and slightly separated from the anterior margin.

Venter (Fig. 2A). Coxa I is furnished with numerous granules which are tipped with a short bristle; coxa II—IV have scattered short bristles; genital plate

and free sternites also covered with similar bristles, bristles being arranged in a transverse row on the sternite.

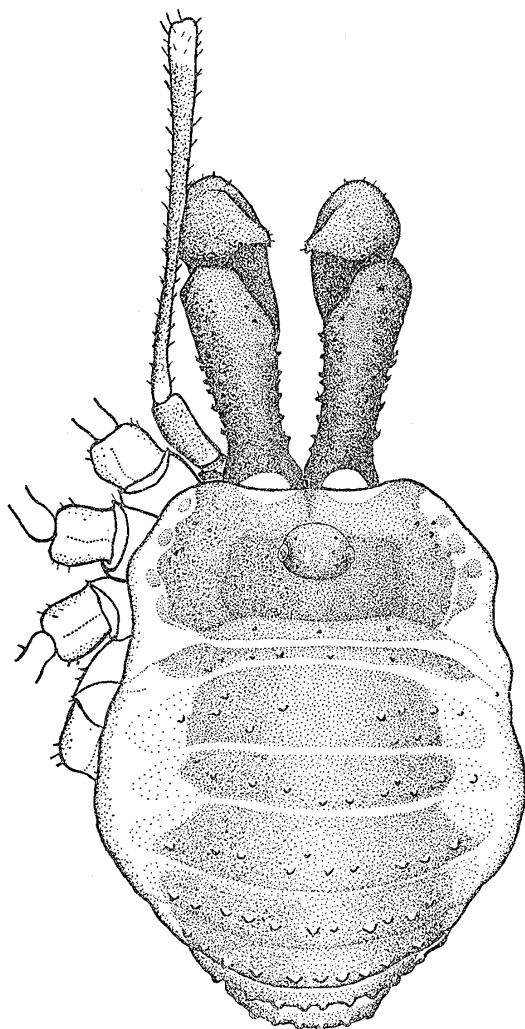


Fig. 1. *Ischyropsalis coreana* n. sp.
Dorsal view of male. ($\times 23$)

Chelicerae (Fig. 2B—D). Strongly developed, robust, longer than the body. Proximal segment: Basally widened but without any particular process, only a little arched ventrally and the medial surface is shallowly depressed at the distal third, where clothed with short hairs; the entire surface of the segment is provided with numerous scattered hair-tipped tubercles, the tubercles rounded, some of which on the dorsal and ventral surface being a little larger than others. Distal segment: Slightly widened near the middle of its length; the basal portion strongly raised medially, producing a stout protuberance, which is slightly curved inward, with a bluntly pointed apex and on the lower margin a few minute granules; the entire surface smooth, covered with only scattered short hairs. The blades of chelicerae are divided into three as shown in Figure 2D; the first division smooth, the second is provided with numerous comb-like spines and the third with teeth at the proximal third.

Palps. Very slender and elongated, whip-shaped. The coxa has a small spinose tubercle below the base; trochanter with two similar tubercles below the apex. The femur slender but gradually increases in width distally

and gently curved toward the ventral side; two spinose tubercles are present below the proximal end and the entire surface clothed with bristle-like hairs, hairs more numerous on the ventral surface. The patella without an apophysis. Tibia and tarsus very slender, covered with numerous short hairs.

Legs. Slender and long. Trochanters are furnished with a few short bristles distally on both sides. Femora to metatarsi clothed with short bristles, but tarsi with only hairs.

Penis (Fig. 2E—F). Corpus penis 0.09 mm wide at the distal portion, 0.22 mm wide at the base; 1.44 mm long. Glans penis 0.30 mm long. Penis deeply pigmented. Corpus penis elongated; glans relatively long and covered completely by two large lateral plates.

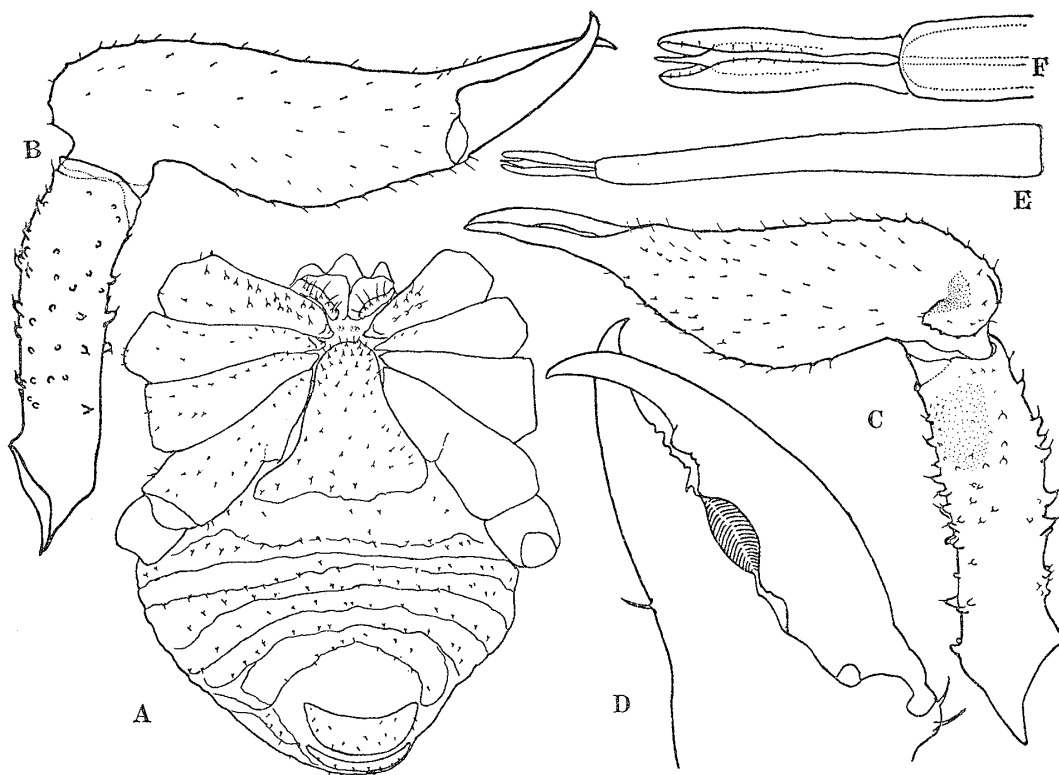


Fig. 2. *Ischyropsalis coreana* n. sp. A. Venter of male. B. Lateral, and C. medial views of male right chelicera. D. Male right cheliceral chela, dorsal. E-F. Ventral views of penis. (A. $\times 23$; B-C. $\times 32$; D. $\times 73$; E. $\times 38$; F. $\times 88$)

Color. The ground color grayish to yellowish white; carapace largely reddish brown with a dark brown median area. Thoracic and all abdominal tergites darkened. Eye tubercle dark brown with a black eye ring. 1–4 coxae reddish brown, distally darkened. Genital plate and free sternites grayish white. Chelicerae dark brown to deep black with a metallic luster. Palps: trochanter and femur reddish to dark brown, but femur distally lighter; patella totally brown, metatarsus and tarsus light brown. Legs: trochanter light yellow above with brown margins, dark brown below; femora dark brown with a white broad distal band, in addition, numerous white rings between the both extremities. The number of rings are: I 9, II 18 or 20, III 8, IV 15. Patellae entirely brown, tibiae brown with a broad white band at the distal end; metatarsi and tarsi uniformly brown.

Measurements. Body. Cephalothorax 1.44 mm wide, 0.75 mm long; abdomen 1.76 mm wide, 1.55 mm long. Total length 2.30 mm.

Chelicerae. Proximal segment 0.32 mm wide at widest portion, 0.93 mm long; distal segment 0.45 mm wide at median portion, 1.76 mm long. Total length 2.69 mm.

Palps. Femur 2.23 mm long; patella 1.33; tibia 1.30; tarsus 0.63. Total length 5.49 mm.

| | | Fem. | Pat. | Tib. | Meta. | Tars. | Total |
|-----|-----|------|------|------|-------|-------|----------|
| Leg | I | 3.95 | 0.76 | 2.40 | 4.13 | 2.18 | 13.42 mm |
| Leg | II | 6.57 | 0.77 | 4.00 | 6.90 | 3.61 | 21.85 |
| Leg | III | 4.39 | 0.73 | 2.26 | 4.58 | 2.13 | 14.09 |
| Leg | IV | 6.32 | 0.78 | 3.10 | 7.16 | 2.97 | 20.33 |

Female.— Not known.

Types: Holotype male, Betal cave, Chungju, Chungbug, Korea, June 28, 1964. Paratype: 1 immature female, Mt. Socrii, Chungbug, Korea, April 11, 1965.

Remarks: The presence of a notable basal protuberance on the second cheliceral segment in the male distinguishes the present new species from all other known species of this genus.

Notes: The genus *Ischyropsalis* is regarded as a typical indicator of the Palearctic Region. And its distribution areas are restricted within southern and central Europe with the exception of Japanese islands. Therefore the present new species is the first record for the Asiatic continent.

Sabacon habei Suzuki

(Fig. 3)

Sabacon habei Suzuki, 1965, Annot. Zool. Japon., 38, 41.

Measurements. Male. Body 1.63 mm wide at widest portion; 2.42 mm long.
Palps

| | Width | Length |
|------------|---------|---------|
| Trochanter | 0.16 mm | 0.31 mm |
| Femur | 0.16 | 0.77 |
| Patella | 0.20 | 0.75 |
| Tibia | 0.19 | 1.09 |
| Tarsus | 0.15 | 0.33 |
| Total | | 3.25 |

Legs. I 7.0, II 10.1, III 7.4, IV 9.9 mm.

Locality: 1 ♂ Simbog cave, Yeonpung, Chungbug, Korea, August 4, 1964; 1 subadult, 1 pull., Mt. Socrii, Chungbug, Korea, April 10, 1965; 1 ♂, 1 pull., Mt. Socrii, Chungbug, Korea, May 16, 1965.

Notes: The dorsal protuberance of the proximal cheliceral segment in the male specimen is more or less low, but the structure of palps and genitalia well accords with *Sabacon habei* from Hokkaido.

The members of this genus regarded as distinct northern elements, are widely distributed in both Pale- and Nearctic Regions. But from the Asiatic continent only two species, *S. crassipes* (L. Koch) (Siberia) and *S. okadai* Suzuki (Manchuria) have so far been recorded. On the other hand, we are rather rich in species on the islands of Japan. Occurrence of the same species in Korea and Japan is of much interest in considering the origin of this interesting genus in Japan.

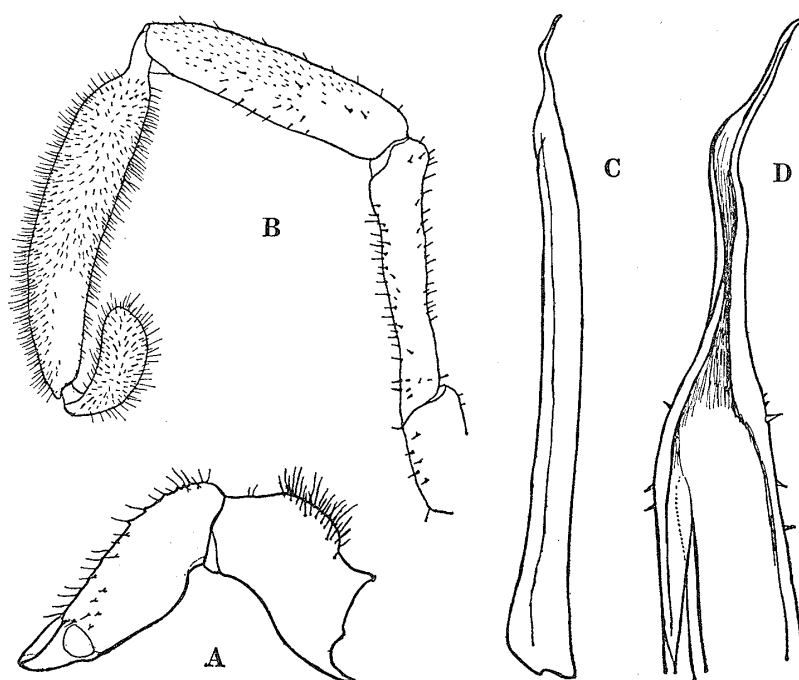


Fig. 3. *Sabacon habei* Suzuki. A. Male left chelicera, lateral. B. Male left palp, lateral. C-D. Lateral views of penis. (A-B. $\times 38$; C. $\times 50$; D. $\times 200$)

Suborder Gonyleptomorphi Šilhaý
 Superfamily Travunoidea Kratochvíl
 Family Travuniidae Absolon et Kratochvíl
Peltonychia coreana n. sp.
 (Figs. 4—6)

Male.—

Dorsum (Fig. 4A and Fig. 5A). Body very small, with slightly raised abdomen. The frontal margin of the cephalothorax only a little curved twice above each chelicera, and the abdomen broadly rounded posteriorly; lateral margins lightly constricted above the third coxae. The scutum nearly smooth with no armaments, tergal groove distinct. Each area of the tergal region and the free tergites have obsolete granules arranged more or less in a transverse row; a longitudinal row of microscopic granules arranged closely to one another along the lateral margin of scutum. Eye tubercle low, rounded, unarmed and rising directly from the anterior margin.

Venter (Fig. 5F). Coxa I has numerous hair-tipped tubercles, three or four of which near the apex being larger than the others. Coxa II is armed with several granules behind the apex and along the hind margin, sometimes one or two granules in front of the distal third. Coxa III is furnished with a row of three to five large granules on the front margin and about ten granules on the hind margin. Coxa IV has a few granules in front of the apex and on the fore

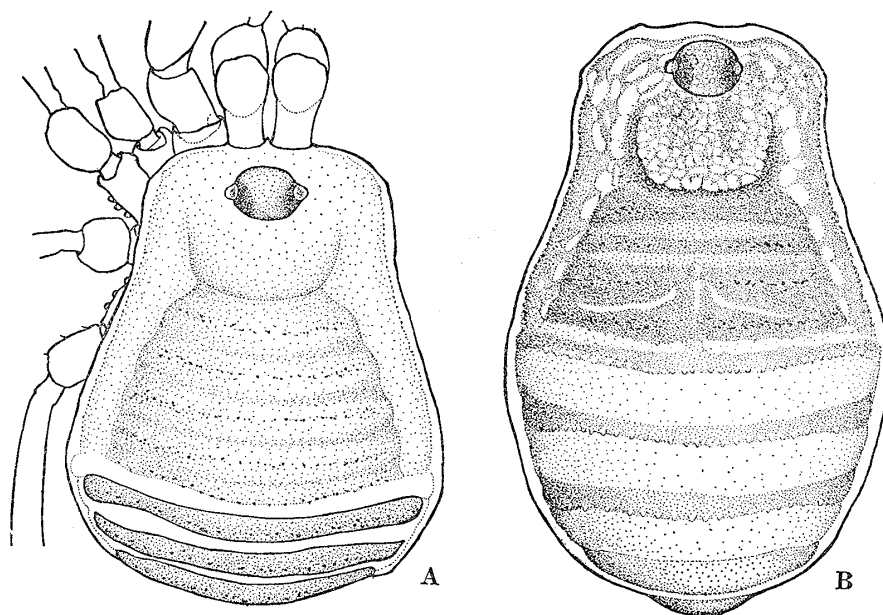


Fig. 4. *Peltonychia coreana* n. sp. A. Male and B. female, dorsal views. (A-B. $\times 33$)

margin and several granules along the hind margin. Sternum very slender, slightly widened basally. All sternites smooth.

Chelicerae (Fig. 5B). Distal half of the proximal segment somewhat raised above, forming a dorsal protuberance, but the segment smooth, without armaments. Distal segment slightly widened, furnished dorsally with a longitudinal row of a few setose tubercles.

Palps (Fig. 5C—E). Well developed, each segment more or less swollen and furnished with numerous setigerous spines. Some spines are long and strong, bearing an elongated seta inserted on the sub-distal surface, others being medium- or small-sized, having a seta on the distal surface. Coxa has a short spine below the apex. Trochanter somewhat rounded, short-stalked, the ventral surface beset with a large spine, behind which is an additional short spine, sometimes one more accessory spine distally on the lateral surface. Femur slightly enlarged toward dorsally, the ventral surface has a large spine just at the proximal end, which is followed by two long spines, the first of the three spines being the longest, the other two almost equal in size, and they are arranged obliquely on the ventro-lateral surface at its proximal third; on the distal two-thirds a row of two moderate spines alternating with three small spines is present, in some specimens a distal spine near the apex being very small and rudimentary. On the medial surface near the distal end are set two spines, the first is long and stout, the second small. The dorsal surface has a row of two or three small setose tubercles. Patella widened distally and strongly arched ventrally, a large spine is present near the apex on the medial surface, sometimes an accessory short spine on each side of the distal margin. Tibia and tarsus flattened ventrally and concave dorsally. The ventral surface of tibia is armed with a

row of four spines on each side, of which the third spine is the largest, the second spine being next largest, the first and fourth spines being small, especially the fourth on the lateral row very small. Tarsus also has a row of four spines and one accessory spine-like seta on each side, the second and third spines being larger than the others. Tarsal claw much shorter than tarsus, only slightly curved.

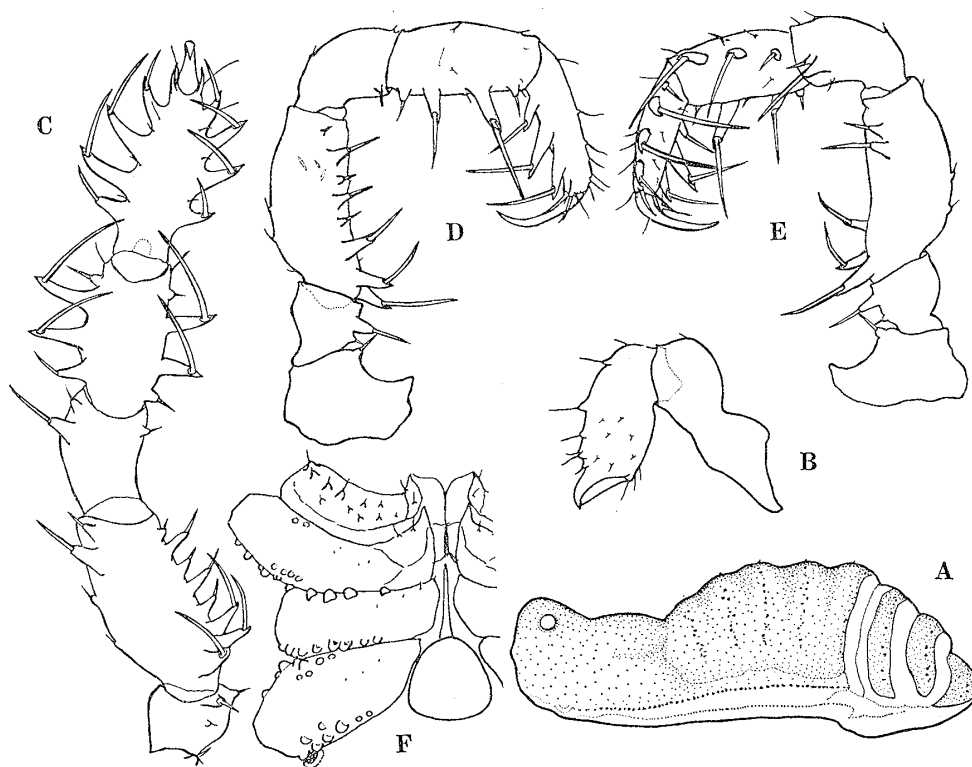


Fig. 5. *Peltonychia coreana* n. sp. A. Lateral view of male, only scutum and free tergites are shown. B. Male right chelicera, medial. C. Male left palp, ventral. D. Male right palp, lateral. E. The same as D., medial. F. Venter of male, 1–4 coxae, sternum and genital plate are shown. (A. $\times 32$; B–F. $\times 40$)

Legs. Relatively short, without any armament. The fourth femur lightly curved S-shape. The calcaneus of metatarsi of all legs are much shorter than the astragalus. The number of tarsal segments: I 3, II 5, III 4, IV 4. Distitarsus of first tarsus with two segments; second tarsus with three segments. The third and fourth tarsi have a stalked peltonychium, which bears three leaflets on each side.

Penis (Fig. 6B–D). The corpus penis is elongated, flattened dorso-ventrally, only a little narrowed at the base. The glans penis is strongly widened basally and terminates in a spoon-shaped body which completely covers the aedeagus. It is furnished with two stout but sharply pointed setae on each side. A pair of wide ventral plates cover the base of the glans.

Color. Ground color beautiful reddish yellow, with dark or black reticulate markings on the anterior portion of the carapace including the eye tubercle and

black shading on the tergal region and the free tergites. Venter concolorous with dorsum. Chelicerae and palps similarly reddish yellow. Some specimens entirely light yellow with no dark markings.

Measurements. Scutum 1.31 mm long, 1.19 mm wide. Total body-length 1.71 mm.

Palps

| | Width | Length | W/L |
|------------|---------|---------|------|
| Trochanter | 0.20 mm | 0.21 mm | 0.95 |
| Femur | 0.20 | 0.52 | 0.38 |
| Patella | 0.20 | 0.32 | 0.66 |
| Tibia | 0.20 | 0.38 | 0.53 |
| Tarsus | 0.17 | 0.40 | 0.43 |
| Total | | 1.83 | |
| Claw | | 0.23 | |

| | | Tro. | Fem. | Pat. | Tib. | Meta. | Tars. | Total |
|-----|-----|------|------|------|------|-------|-------|---------|
| Leg | I | 0.18 | 0.72 | 0.25 | 0.58 | 0.75 | 0.51 | 2.99 mm |
| Leg | II | 0.23 | 1.09 | 0.38 | 1.13 | 1.20 | 0.96 | 4.99 |
| Leg | III | 0.19 | 0.84 | 0.33 | 0.77 | 0.99 | 0.60 | 3.72 |
| Leg | IV | 0.23 | 1.04 | 0.35 | 0.97 | 1.32 | 0.78 | 4.69 |

Female.—

The female (Fig. 4B) resembles the male in coloration and general appearance. Except for a slight difference in body size there are no significant secondary sexual characters. Ovipositor is as shown in Figure 6E.

Measurements. Scutum 1.25 mm long, 1.30 mm wide. Total body-length 1.99 mm.

Palps

| | Width | Length |
|------------|---------|---------|
| Trochanter | 0.21 mm | 0.22 mm |
| Femur | 0.22 | 0.61 |
| Patella | 0.22 | 0.40 |
| Tibia | 0.22 | 0.46 |
| Tarsus | 0.17 | 0.48 |
| Total | | 2.17 |
| Claw | | 0.24 |

| | | Tro. | Fem. | Pat. | Tib. | Meta. | Tars. | Total |
|-----|-----|------|------|------|------|-------|-------|---------|
| Leg | I | 0.19 | 0.73 | 0.34 | 0.61 | 0.70 | 0.52 | 3.09 mm |
| Leg | II | 0.23 | 1.01 | 0.33 | 0.97 | 1.03 | 0.91 | 4.48 |
| Leg | III | 0.19 | 0.77 | 0.29 | 0.69 | 0.85 | 0.47 | 3.26 |
| Leg | IV | 0.19 | 0.89 | 0.35 | 0.87 | 1.26 | 0.70 | 4.26 |

Types: Holotype male, Mt. Socrii, Chungbug, Korea, June 19, 1965. Paratypes: 1♂, Samcheog, Kangwen Do (cave), July 28, 1963; 2♂♂, Betal cave, Chungju, Chungbug, June 28, 1964; 1♀, Bagjwi cave, Mt. Surii, Chungbug, July

5, 1964; 2♀♀, Pyeongchang, Kangwen Do (cave), July 29, 1964; 2♀♀, Mt. Socrii, Chungbug, April 10, 1965; 1♂, 4♀♀, Mt. Buyong, Eumseong, Chungbug, April 18, 1965; 1♂, 2♀♀, Mt. Socrii, Chungbug, May 16, 1965; 1♂, 3♀♀, Mt. Buyong, Eumseong, Chungbug, June 13, 1965; 2♀♀, Mt. Socrii, Chungbug, June 19, 1965.

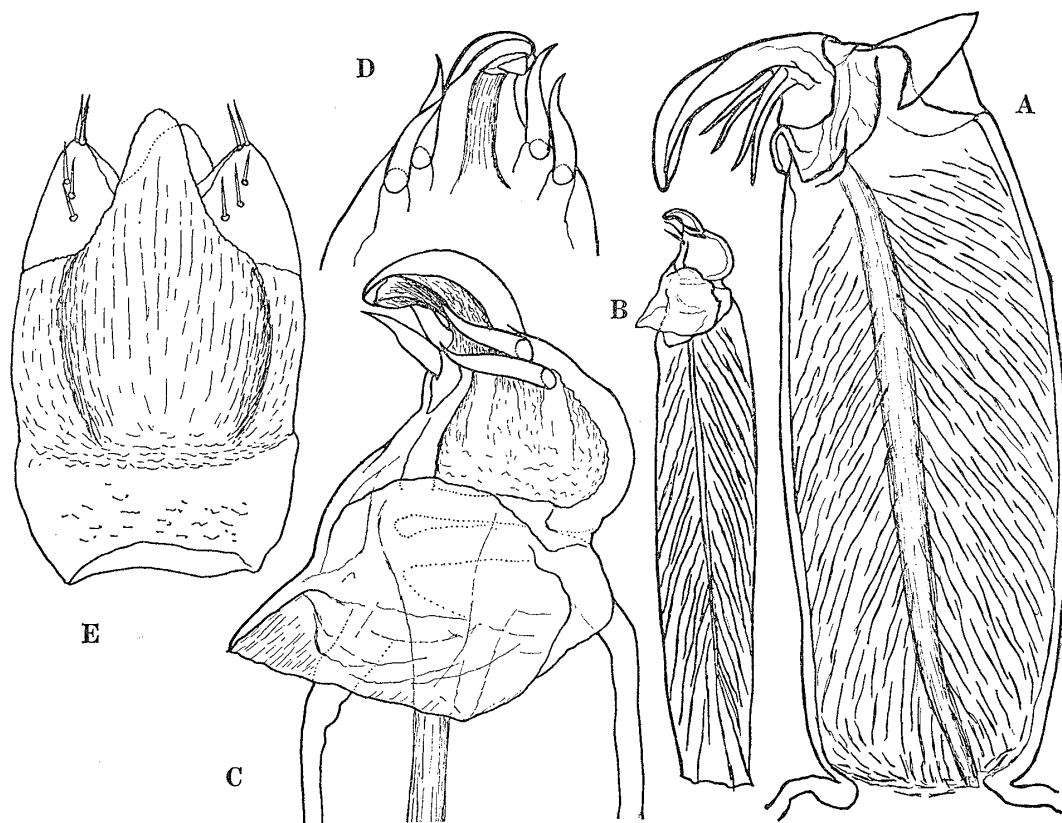


Fig. 6. Penis and ovipositor of two closely related species of *Peltonychia*. A. Penis of *P. japonica* (from Mt. Ishizuchi, Shikoku, Japan). B-D. Penises and E. ovipositor of *P. coreana* n. sp. (A-B, E. $\times 78$; C. $\times 310$; D. $\times 385$)

Remarks: The present new species *P. coreana* resembles *P. japonica* very much in general appearance, but the palpal segments of the former are not as thick as in the latter. In addition, a notable difference can be found in the male genitalia. As shown in the following table and Figures 6A–D, males of both species with an approximately similar body length differ strikingly in size and

Comparison of the penis between the two closely related forms of *Peltonychia*

| Spp. | Body L. | Corpus penis | | | Glans penis L. |
|----------------------|---------|--------------|---------|------|----------------|
| | | Width | Length | W/L | |
| <i>P. japonica</i> ♂ | 1.62 mm | 0.34 mm | 0.87 mm | 0.39 | 0.30 mm |
| <i>P. coreana</i> ♂ | 1.71 | 0.12 | 0.63 | 0.19 | 0.11 |

shape of the penis. The corpus penis of *japonica*¹⁾ is enormously thick and stout as compared with that of *coreana*. The structure of the glans penis also differs remarkably between both forms (compare A with C—D in Fig. 6). The glans of *coreana* has no dorsal plates such as seen in *japonica*, but with large ventral plates, and there is also very much contrast between the shape of their accessory setae. The difference between the structure of penis of males of both forms is thus so striking as to separate them specifically.

Peltonychia coreana longipes n. s. sp.
(Fig. 7)

Male.—

Body. Similar in structure to *coreana*, but slightly larger. Coxa II is armed with a few granules behind the apex. Coxa III is furnished with two granules near the apex of the front margin and about five granules behind the distal third. Coxa IV has one or two granules near the distal end of the posterior margin. Maxillary lobes and sternum as in *coreana*.

Chelicerae (Fig. 7A). Similar to *coreana*.

Palps (Fig. 7B—C). Differing from *coreana* as follows: All the segments are longer than those of *coreana* and ventral spines are more slender. However, the accessory spines on the ventro-lateral surface of the femur are less strong. Patella has no accessory spines except for a large spine on the medial surface.

Legs. All legs very long, two times as long as that of *coreana*. Peltonychium as shown in Figure 7E.

Penis. Similar in structure to *coreana*.

Color. Body and appendages are uniformly light yellow, with no dark markings.

Measurements. Scutum 1.51 mm long, 1.51 mm wide. Total body-length 1.91 mm.

Palps

| | Width | Length | W/L |
|------------|---------|---------|------|
| Trochanter | 0.24 mm | 0.30 mm | 0.80 |
| Femur | 0.23 | 0.78 | 0.29 |
| Patella | 0.22 | 0.46 | 0.48 |
| Tibia | 0.22 | 0.59 | 0.37 |
| Tarsus | 0.18 | 0.69 | 0.26 |
| Total | | 2.82 | |
| Claw | | 0.29 | |

| | | Tro. | Fem. | Pat. | Tib. | Meta. | Tars. | Total |
|-----|-----|------|------|------|------|-------|-------|-------|
| Leg | I | 0.23 | 1.41 | 0.46 | 1.26 | 1.68 | 1.13 | 6.17 |
| Leg | II | 0.28 | 2.64 | 0.61 | 2.43 | 2.83 | 2.57 | 11.36 |
| Leg | III | 0.28 | 1.69 | 0.46 | 1.35 | 2.12 | 1.42 | 7.32 |
| Leg | IV | 0.33 | 2.35 | 0.52 | 1.83 | 2.54 | 1.69 | 9.26 |

1) Concerning the penis of this species, no information was given in the original report.

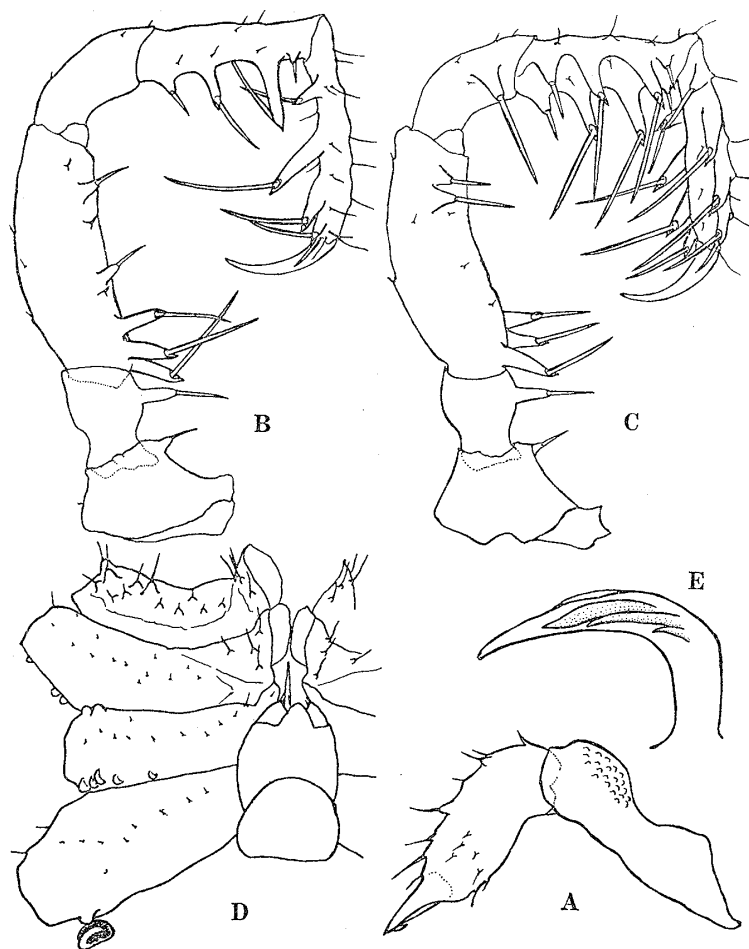


Fig. 7. *Peltonychia coreana longipes* n. s. sp. A. Male right chelicera, medial. B. Male right palp, lateral. C. Male left palp, medial. D. Venter of female, 1-4 coxae, genital plate, ovipositor and a part of sternum are shown. E. Lateral view of peltonychium of the 4th tarsus. (A-D. $\times 40$; E. $\times 315$)

Female.— General features similar to the male, but larger body.

Measurements. Scutum 1.56 mm long, 1.78 mm wide. Total body-length 2.55 mm.

Palps

| | Width | Length |
|------------|---------|---------|
| Trochanter | 0.22 mm | 0.29 mm |
| Femur | 0.22 | 0.70 |
| Patella | 0.22 | 0.46 |
| Tibia | 0.22 | 0.59 |
| Tarsus | 0.18 | 0.68 |
| Total | | 2.72 |
| Claw | | 0.29 |

| | | Tro. | Fem. | Pat. | Tib. | Meta. | Tars. | Total |
|-----|-----|------|------|------|------|-------|-------|-------|
| Leg | I | 0.23 | 1.32 | 0.47 | 0.99 | 1.46 | 0.94 | 5.41 |
| Leg | II | 0.28 | 2.33 | 0.53 | 2.12 | 2.68 | 2.11 | 10.05 |
| Leg | III | 0.28 | 1.64 | 0.52 | 1.27 | 1.98 | 1.27 | 6.96 |
| Leg | IV | 0.28 | 2.16 | 0.51 | 1.64 | 2.72 | 1.57 | 8.88 |

Types: Holotype male, Gongidong cave near Chungju, Chungbug, Korea, May 26, 1963. Paratypes: 1 ♀, same data as holotype; 1 ♂, same locality as holotype, October 6, 1963.

Remarks: This form is clearly separated from *coreana* by the relative length of legs and palpal segments and by the armament of the coxae of legs. In particular, legs of *longipes* are twice as long as those of *coreana* in spite of only a slight difference in body size.

Notes: Hitherto, the remarkable family Travuniidae to which the present and the foregoing forms belong have been recorded exclusively from southern Europe. Only recently were two species found to occur in the south-western parts of Japan (Miyosi 1957, Suzuki 1964). The two Korean forms described here are thus the first record for the Asiatic continent. It may possibly be found that the distribution of travuniids is continuous from Europe to eastern Asia after more is known of the Asiatic species.

The author wishes to thank Mr. J. Nam-Gung for his kind presentation of material.

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